UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,742	02/12/2004	William Preston Alexander III	AUS920030821US1	5609

35525 7590 12/11/2007

IBM CORP (YA)
C/O YEE & ASSOCIATES PC
P.O. BOX 802333
DALLAS, TX 75380

EXAMINER	
ROMANO, JOHN J	

ART UNIT	PAPER NUMBER
2192	

MAIL DATE	DELIVERY MODE
12/11/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/777,742	ALEXANDER ET AL.	
	Examiner	Art Unit	
	John J. Romano	2192	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 September 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's amendment and response received September 17th, 2007 responding to the June 18th, 2007, Office action provided in the rejections of claims 1-23, wherein claims 1-23 are pending in the application and which have been fully considered by the examiner.

Applicant's arguments and amendments with respect to the drawings are persuasive. Accordingly, the objections to the specification and drawings are withdrawn.

Applicant's arguments and amendments with respect to the U.S.C. §101 rejections are persuasive. Accordingly, the U.S.C. §101 rejections are withdrawn.

Applicant arguing for the claims being patentable over *the prior art* (see pages 10-16 of the amendment and response) are not persuasive, as will be addressed under Prior Art's Arguments – Rejections section at item 2 and the claim rejections below. Thus, the rejection of the claims over prior art in the previous Office action is maintained in light of the necessitated additional clarifications provided hereon and **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Prior Art's Arguments – Rejections

2. Applicant's arguments filed September 27th, 2007, in particular on pages 17-24, have been fully considered but they are not persuasive. For example,

(A) In regard to the argument that *Cohen* does not disclose or suggest the steps of "adding the call tree data structures to generate an added call tree data structure", or "calculating an average of values associated with each node in the added call tree data structure to generate an averaged call tree data structure" as recited in claim 1 (See Remarks (9/27/2007) p. 12, last paragraph,) the Examiner respectfully disagrees. As acknowledged by applicant's recited passage of Cohen (Remarks (9/27/2007) p. 12,) the instant recitation states "multiple runs can also be used, in which case, the results may be averaged". Furthermore, as noted in the previous office action (office action (6/18/2007) p.7,) Cohen's generated call tree data structure averages the values of the respective nodes, wherein the averaging of a metric/value for a respective node, necessarily comprises taking the sum of a group of values and dividing by the number of values.

Additionally, it is clear that this averaging, which takes place in the context of the nodes and edge weights based on profiling information (trace data). It is also noted that

the generated call tree data structure, although not expressly discloses or displayed, must be created in order to compute the average, even if only in intermediate textual format. Accordingly, Cohen indeed discloses generating an added call tree data structure and calculating an average of values associated with each node in the added call tree data structure in order to generate an averaged call tree data structure.

In regard to the argument that *Cohen* does not disclose averaging with respect to call tree data structures (See Remarks (9/27/2007) p. 12, fourth paragraph,) the Examiner respectfully disagrees. It is noted that examiner's cited passage of the previous office action, explicitly reproduced by applicant (See Remarks (9/27/2007) p. 12, second paragraph,) expressly discloses "Edge weights are assigned based on the actual number of calls made from one method to another and the volume of data passed during those calls" (emphasis added.) Here, the averaging of the respective nodes, comprising the call data in a hierarchical structure clearly pertains to call tree data structures. As addressed above, the call tree is added in order to generate an averaged data structure. Therefore, contrary to applicant's statement (Remarks (9/27/2007) p. 12,) Cohen does indeed disclose the instant limitations of claim 1.

(B) In regard to the argument that *Kazi* does not teach minimizing the effect of variations in various executions of a computer program (See response, page 13, 2nd paragraph,) the Examiner respectfully disagrees. As acknowledged by the applicant (See response, page 13, 2nd paragraph,) Kazi teaches merging the trace data. In regard to the trace data, Kazi discloses:

> "To facilitate the performance analysis of the call graph, statistical information about each of the methods in the program is gathered in the merge step. Each detailed .prf trace file is analyzed to gather the total number of calls made to each method, the maximum, minimum, and average execution times, and the standard deviation of the execution time for each method." (Kazi, page 100, "run-time statistics generation" – emphasis added.)

Thus, in regard to the merge step cited, it is clear that Kazi's discloses averaging specific information of a call graph by totaling the data and computing the average. Averaging the various runs (various values of a respective node) of a computer program inherently minimizes variations (each value relating to a run) in the profile data (trace data). Therefore, contrary to applicant's statement, Kazi indeed teaches minimizing the effect of variations in various executions of a computer program.

(C) In regard to the argument that *Kazi's* disclosure does not teach or suggest walking a second call tree data structure over the first call tree data structure to generate the added call tree data structure (See response, page 13, 5th paragraph,) the Examiner respectfully disagrees. It should be noted that walking the first and second data structures are interpreted as traversing the data structure to gather "to generate the added call tree data structure" as claimed and argued, respectively in claim 4. In this regard, Kazi expressly discloses:

> While traversing the nodes, it gathers all the pertinent information for each node. Once all the children of the root are traversed, they are displayed. (Kazi, page 111, "Visualizer" - emphasis added.)

Accordingly, Kazi's disclosure would read on the claimed language, even arguably if applicant was to argue that walking the data structure necessarily required each node of the graph. However, the plain language of the claim, merely requires the information to be gathered to "generate the added call tree data structures". Correspondingly, as addressed above, Kazi indeed generates the call tree data structures with respect to various runs (first and second call trees). Thus, Kazi indeed teaches "walking a second call tree data structure over the first call tree data structure to generate the added call tree data structure" as claimed.

(D) In regard to the argument that the reference in Alexander to base and Cum values is not a teaching of the steps specifically recited in claims 5 and 6 (See response, page 15, 3rd paragraph,) the Examiner respectfully disagrees. It should be noted that the reference in Alexander is only relied upon to teach the cited limitations (e.g., arcflow tool, base and cum values, xtree report) as cited in the previous office action and herein-below in the claim rejections. Accordingly, with respect claims 5 and 6, Alexander is relied upon to teach the concept of base and cumulative values associated with respect nodes in a call tree data structure. Thus, the rejection is maintained in view of applicant's instant arguments.

(E) In regard to Applicant's remaining arguments which refer to the above addressed issues, see the corresponding above response above in sections (A) – (D), wherein the corresponding issues are addressed above. Thus, the rejection of the claims is maintained.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims **1, 4, 7, 9, 12, 15, 17, 20** and **23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen et al., US 6,011,918 (art made of record & hereinafter **Cohen**) in view of Kazi et al., "JaViz: A client/server Java profiling tool" (art made of record & hereinafter **Kazi**).

In regard to claim **1**, **Cohen** discloses:

- "*A method, in a data processing system, for averaging out variations in trace data obtained from a plurality of executions of a computer program...*" (E.g., see Figure 5 & Column 12, lines 25-28), wherein each detailed trace file is analyzed to gathered in the merge step, comprising average execution time for each method.
- "*...obtaining call tree data structures corresponding to the trace data for the plurality of executions of the computer program...*" (E.g., see Figure 8 & Column 10, lines 46-51), wherein call graphs with weighted nodes are disclosed.
- "*...adding the call tree data structures to generate an added call tree data structure; calculating an average of values associated with each*

node in the added call tree data structure to generate an averaged call tree data structure..." (E.g., see Figure 5 & Column 12, lines 25-28), wherein profiles are collected for multiple runs and the results associated with each node of the call tree are averaged. It is also noted that the generated added call tree data structure, although not expressly disclosed or displayed, must be created in order to compute the average. The averaging of a metric for a respective node, is in a hierarchical structure, even if in intermediate textual format, and necessarily added and divided to obtain the average of the particular metric.

But **Cohen** does not expressly disclose "*...the affect of variations in trace data of various executions of the computer program are minimized in the averaged call tree data structure*". However, **Kazi** discloses:

- "*...and outputting the averaged call tree data structure, wherein the affect of variations in trace data of various executions of the computer program are minimized in the averaged call tree data structure.*" (E.g., see Table 1 & page 100, "Run-time statistics generation"), wherein to facilitate the performance analysis of the call graph, statistical information is averaged (execution times) and the standard deviation for each method, thereby minimizing the display for each execution.

Cohen and **Kazi** are analogous art because they are both concerned with the same field of endeavor, namely, a distributed application profiling tool. Therefore, at the

time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine **Kazi's** averaging minimization with **Cohen's** profiling method. The motivation to do so would have been to discover the amount of time spent in cert6ain methods as disclosed by Kazi (See page 96, "Inefficient methods") to analyze the performance of the java application program.

In regard to claim **4**, the rejections of base claim **1** are incorporated. Furthermore, **Kazi** discloses:

- "*...walking a second call tree data structure over the first call tree data structure to generate the added call tree data structures.*" (E.g., see Table 1 & page 111, "visualizer"), wherein traversing (walking) the nodes to gather the pertinent information is disclosed.

In regard to claim **7**, see claim **1**.

In regard to claims **9, 12** and **15**, this is a program in a computer readable medium version of the claimed method discussed above, in claims **1, 4** and **7**, wherein all claimed limitations have also been addressed and/or cited as set forth above.
In regard to claims **17, 20** and **23**, this is an apparatus version of the claimed method discussed above, in claims **1, 4** and **7**, wherein all claimed limitations have also been addressed and/or cited as set forth above.

4. Claims **2-3, 5-6, 8, 10-11, 13-14, 16, 18-19** and **21-22** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Cohen** in view of **Kazi** and in further view of

Alexander et al., "A unifying approach to performance analysis in the Java environment" (art of record & hereinafter **Alexander**).

In regard to claim **2**, the rejections of base claim **1** are incorporated. **Cohen** and **Kazi** do not expressly disclose "*...inputting the trace data to an arcflow tool, wherein the arcflow tool generates the call tree data structures based on the trace data.*". However, **Alexander** discloses:

- "*...inputting the trace data to an arcflow tool, wherein the arcflow tool generates the call tree data structures based on the trace data.*" (E.g., see Figure 4 & page 125, "Building the arcflow model"), wherein the arcflow tool is disclosed.

Cohen, Kazi and **Alexander** are analogous art because they are both concerned with the same field of endeavor, namely, a distributed application profiling tool. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine **Alexander's** arcflow tool with **Cohen and Kazi's** profiling method. The motivation to do so would have been to allow users to view callstack trees graphically and cross-reference the various x-files to enhance the value of arcflow as disclosed by **Alexander** (See page 131, "Future work").

In regard to claim **3**, the rejections of base claim **1** are incorporated. **Cohen** and **Kazi** do not expressly disclose "*...the call tree data structures are xtree data structures.*". However, **Alexander** discloses:

- "...*the call tree data structures are xtree data structures.*" (E.g., see Figure 4 & page 125, "The xtree report"), wherein the xtree report is disclosed.

In regard to claim **5**, the rejections of base claim **4** are incorporated. **Cohen** teaches the adding of values associated with each node as disclosed above with relation to claim **1**. However, **Cohen** and **Kazi** do not expressly disclose "...*adding a base value of the node in the second call tree data structure to a base value of a corresponding node in the first call tree data structure.*" However, **Alexander** discloses:

- "...*a base value....*" (E.g., see page 124, first paragraph), wherein the base, calls and cum values are disclosed.

Therefore, it would have been obvious to add the base value of the second node tree data structure to a base value of a corresponding node in the first tree data structure to generate the average for each node metric as disclosed above.

In regard to claim **6**, the rejections of base claim **4** are incorporated. But **Cohen** and **Kazi** do not expressly disclose "...*for each node that exists in only one of the first call tree data structure and the second call tree data structure, creating a node in the added call tree data structure having a base value corresponding to the base value of the node that exists in either of the first call tree data structure or the second call tree data structure.*". However, it would have been an inherent result of the averaging computation if a value only existed for one node.

In regard to claim **8**, the rejections of base claim **1** are incorporated. But **Cohen** and **Kazi** do not expressly disclose "...*wherein the values associated with each node*

include a base value, a number of calls, a cumulative value, and an absolute cumulative value.". However, **Alexander** discloses:

- "*...wherein the values associated with each node include a base value, a number of calls, a cumulative value, and an absolute cumulative value.*" (E.g., see page 124, first paragraph), wherein the base, calls and cum values are disclosed.

In regard to claims **10-11, 13-14** and **16**, this is a program in a computer readable medium version of the claimed method discussed above, in claims **2-3, 5-6** and **8**, wherein all claimed limitations have also been addressed and/or cited as set forth above.

In regard to claims **18-19** and **21-22**, this is an apparatus version of the claimed method discussed above, in claims **2-3** and **5-6**, wherein all claimed limitations have also been addressed and/or cited as set forth above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Romano whose telephone number is (571) 272-3872. The examiner can normally be reached on 8-5:30, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on (571) 272-3695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JJR

TUAN DAM
SUPERVISORY PATENT EXAMINER